CF-540

E Model
GEP Model

FM/AM RADIO CASSETTE-CORDER

SPECIFICATIONS

RADIO SECTION

Frequency Range: FM 87.5 – 108 MHz
AM 530 – 1,605 kHz

Antennas: FM: Telescopic antenna
External antenna terminals
AM: Built-in ferrite-rod antenna

TAPE RECORDER SECTION

Recording System: 4-track 2-channel stereo

Tape Speed: 4.8 cm/s (1⅞ ips)

Frequency Response: 50 – 10,000 Hz (with standard tape-cassette)
50 – 13,000 Hz (with chromium dioxide tape-cassette)

S/N Ratio: 45 dB

Total Harmonic Distortion: 2.5 %

Wow and Flutter: 0.22 %

Inputs:
MIC ..... 2 (mini jack)
sensitivity 0.2 mV (–72 dB)
for low impedance microphone
LINE IN ..... 2 (phono jack)
sensitivity 0.06 V (–22 dB)
input impedance 560 kΩ

Outputs:
LINE OUT ..... 2 (phono jack)
rated output 0.44 V (–5 dB)
at load impedance 100 kΩ
load impedance 10 kΩ or higher
MONITOR ..... 1 (mini jack)
rated output 0.44 V (–5 dB)
at load impedance 10 kΩ
optimum for 8 Ω earphone or load impedance 10 kΩ or higher
HEADPHONES jack .. 1 (stereo binaural jack)
load impedance 8 Ω

Other Jacks:
REC/PB 1
REMOTE 1

GENERAL

Power Requirements: 110, 127, 220, or 240 V ac, 50/60 Hz (GEP Model)
100 – 110, 115 – 127, 200 – 220, or 230 – 250 V ac, 50/60 Hz (E Model)
6 V dc, four size D batteries, Rechargeable Battery Pack BP-8H (optional), or 12 V car battery with Sony Car Battery Cord DCC-129 (optional)

Power Consumption: 10 W ac

Power Output: 1.5 W (max.)

Speaker: 10 cm, dia. (4 inches)

Battery Life: Approx. 7 hours of continuous recording from the Built-in Microphone with Sony Long-Life Batteries size D

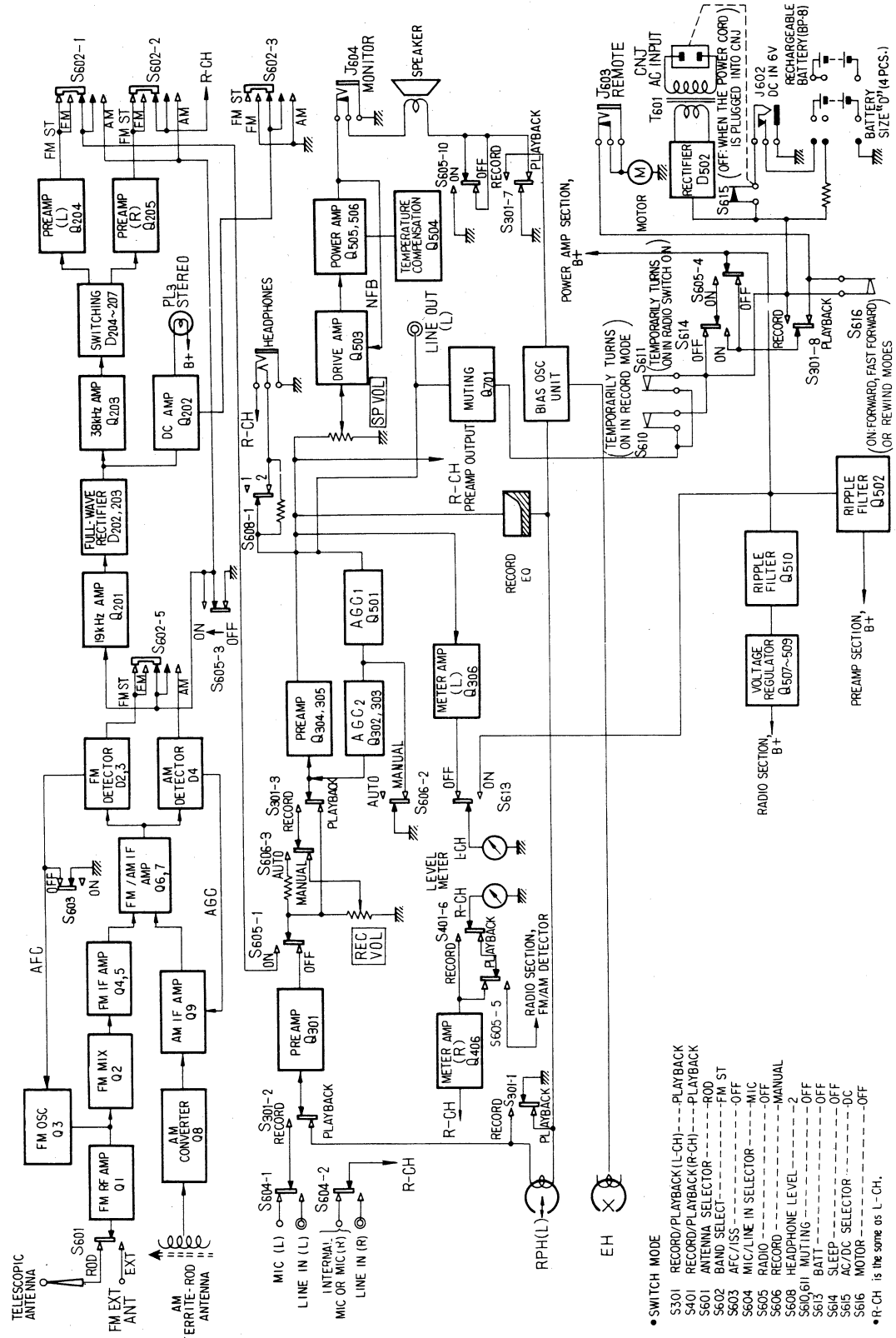
Dimensions: Approx.
370(w) x 105(h) x 240(d) mm
14⅝(w) x 4¼(h) x 9½(d) inches
incl. projecting parts and controls

Weight: Approx. 4.9 kg (10 lb 13 oz)
with batteries

SONY®

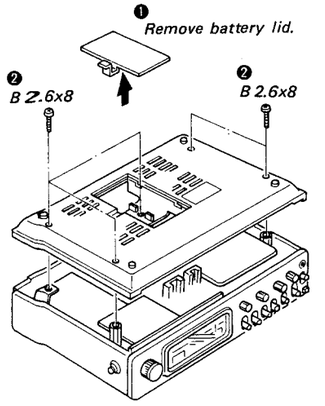
SERVICE MANUAL

1. BLOCK DIAGRAM

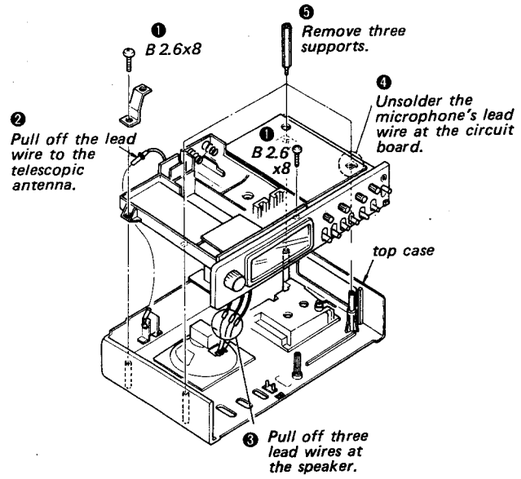


2. DISASSEMBLY

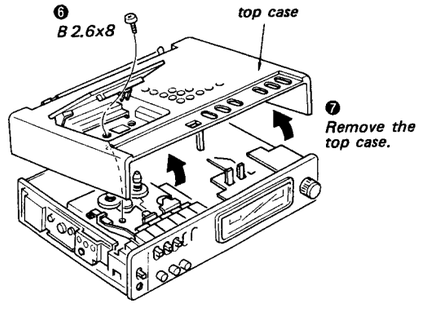
[LOWER CASE REMOVAL]



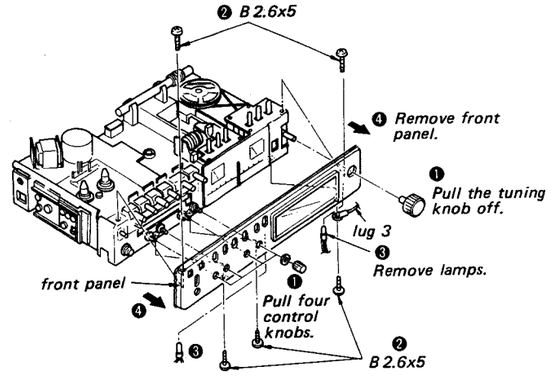
[UPPER CASE REMOVAL]


❶ B 2.6x8
❺ Remove three supports.
❹ Unsolder the microphone's lead wire at the circuit board.
❷ Pull off the lead wire to the telescopic antenna.
❶ B 2.6 x8
top case
❸ Pull off three lead wires at the speaker.

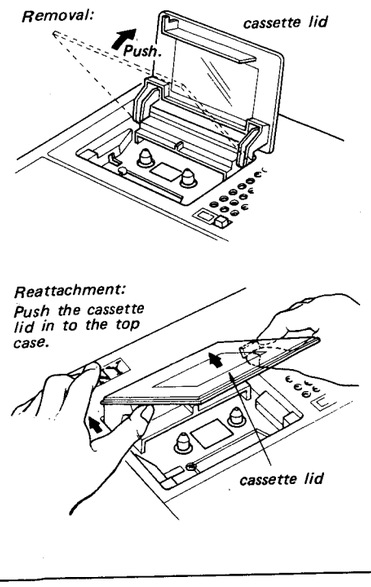
Note: When reattaching the top case, set the RADIO and SLEEP switches to ON position. Also check that PAUSE and tape counter knobs project from the appropriate holes of the top case.



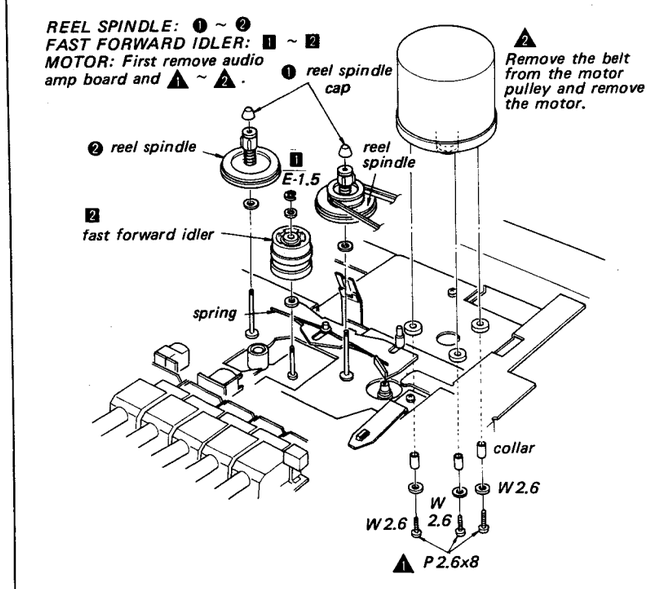
[FRONT BRACKET REMOVAL]



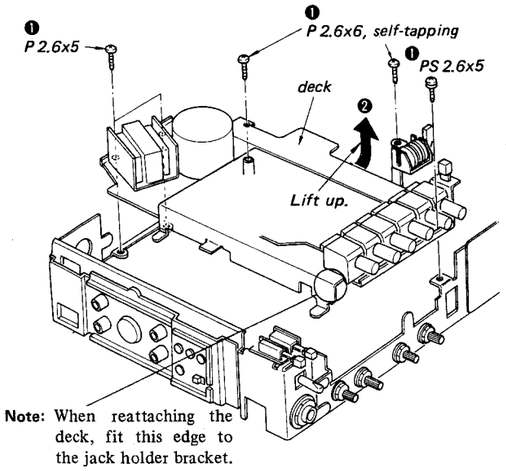
[CASSETTE LID REMOVAL AND REATTACHMENT]



[MOTOR, REEL SPINDLE and FAST FORWARD IDLER REMOVALS]



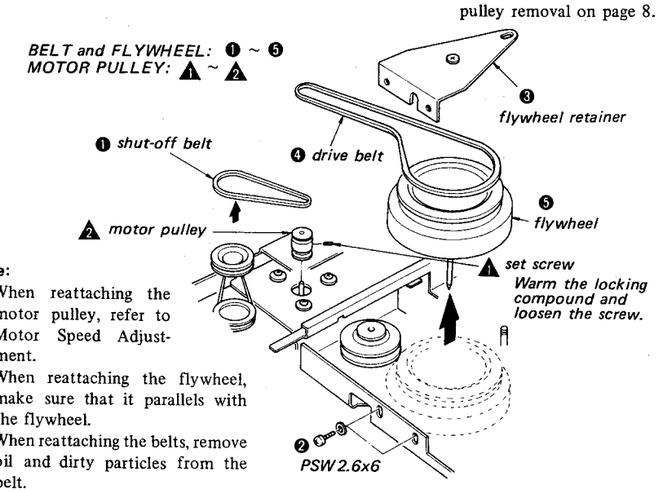
[DECK REMOVAL]



Note: When reattaching the deck, fit this edge to the jack holder bracket.

[BELT, MOTOR PULLEY and FLYWHEEL REMOVAL]

Note: Perform this removal after the tension pulley removal on page 8.

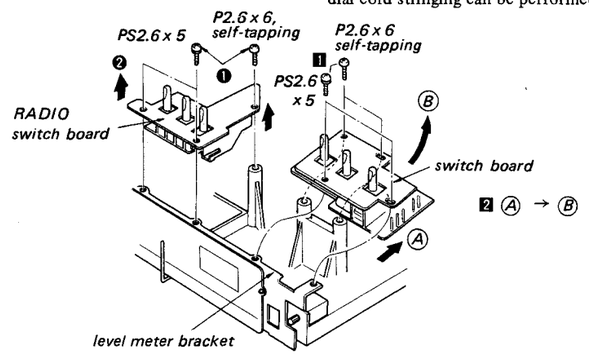


Note:
1. When reattaching the motor pulley, refer to Motor Speed Adjustment.
2. When reattaching the flywheel, make sure that it parallels with the flywheel.
3. When reattaching the belts, remove oil and dirty particles from the belt.

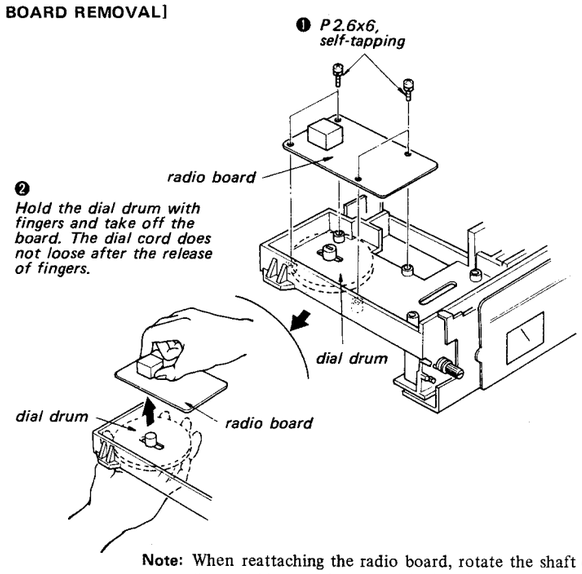
[SWITCH BOARD REMOVAL]

RADIO Switch Board: ❶ ~ ❷
BAND SELECT Switch Board: 1 ~ 2

Note:
After the two switch boards are removed, dial cord stringing can be performed.

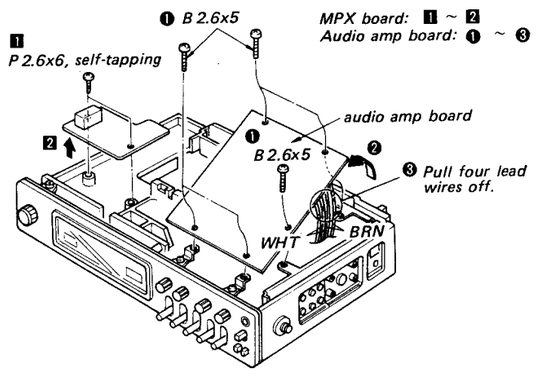


[RADIO BOARD REMOVAL]

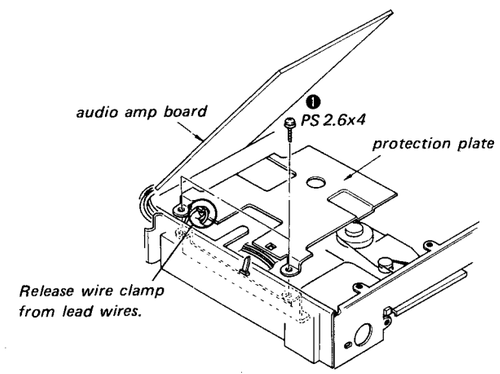

❶ P 2.6x6, self-tapping
radio board
❷
Hold the dial drum with fingers and take off the board. The dial cord does not loose after the release of fingers.
dial drum
dial drum
radio board

Note: When reattaching the radio board, rotate the shaft of the variable capacitor to original position and perform the procedure in reversed way.

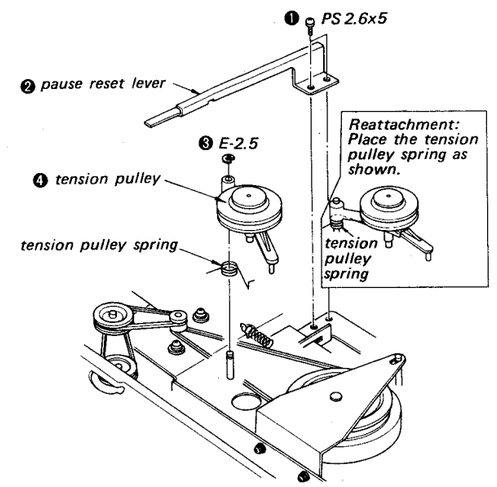
[MPX and AUDIO AMP BOARD REMOVALS]



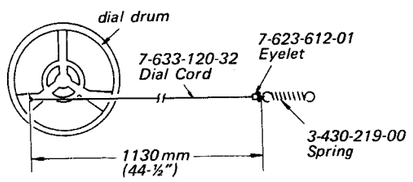
[PROTECTION PLATE REMOVAL]

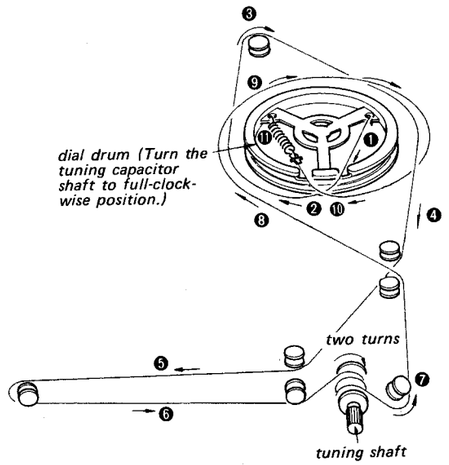


[TENSION PULLEY REMOVAL]

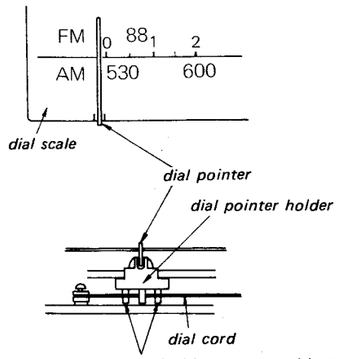


3. DIAL CORD STRINGING



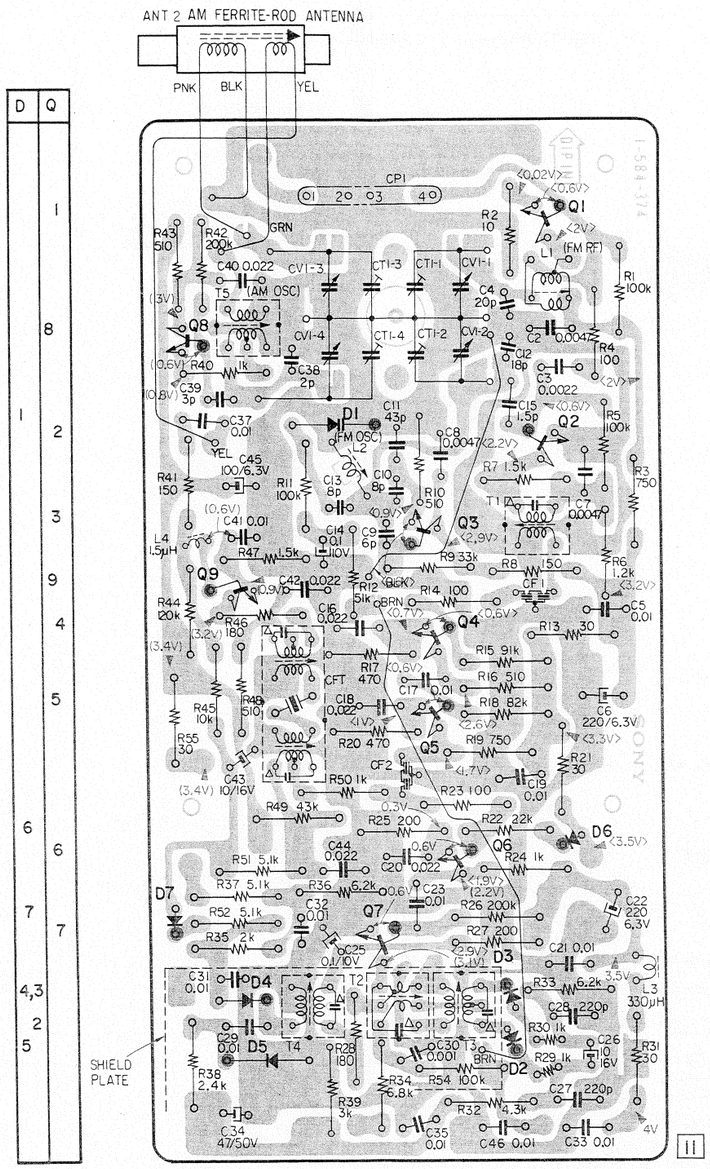


Set the tuning shaft to full-counterclockwise position.



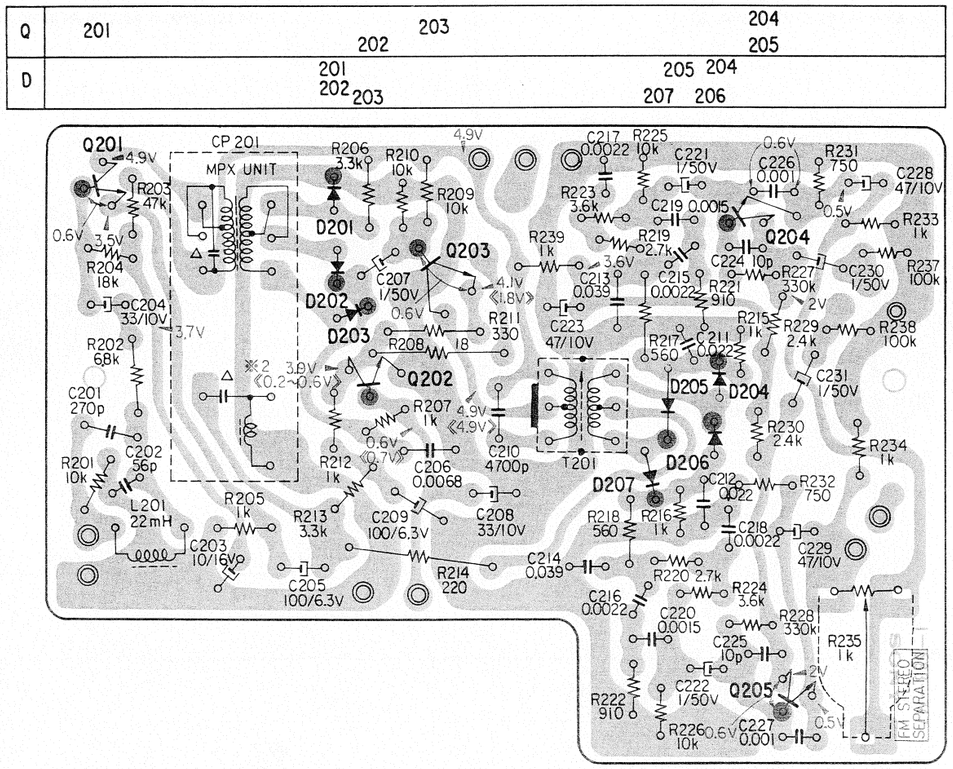
4. MOUNTING DIAGRAM – Radio Board –

– Conductor Side –



5. MOUNTING DIAGRAM – MPX Board –

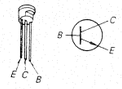
– Conductor Side –



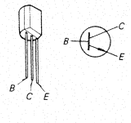
6. MOUNTING DIAGRAM

– Conductor and Component Sides –

Q1: 2SC930
Q2, 3: 2SC668

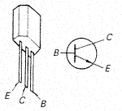


Q4~9: 2SC710

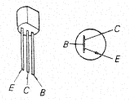


Q201~203
Q302~306
Q402~406
Q501~504
Q507, 509
Q701, 801 } 2SC1363

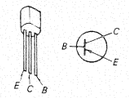
Q204, 205
Q301, 401 } 2SC1361



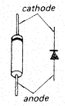
Q505, 506, 510: 2SC1474



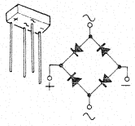
Q508: 2SA683



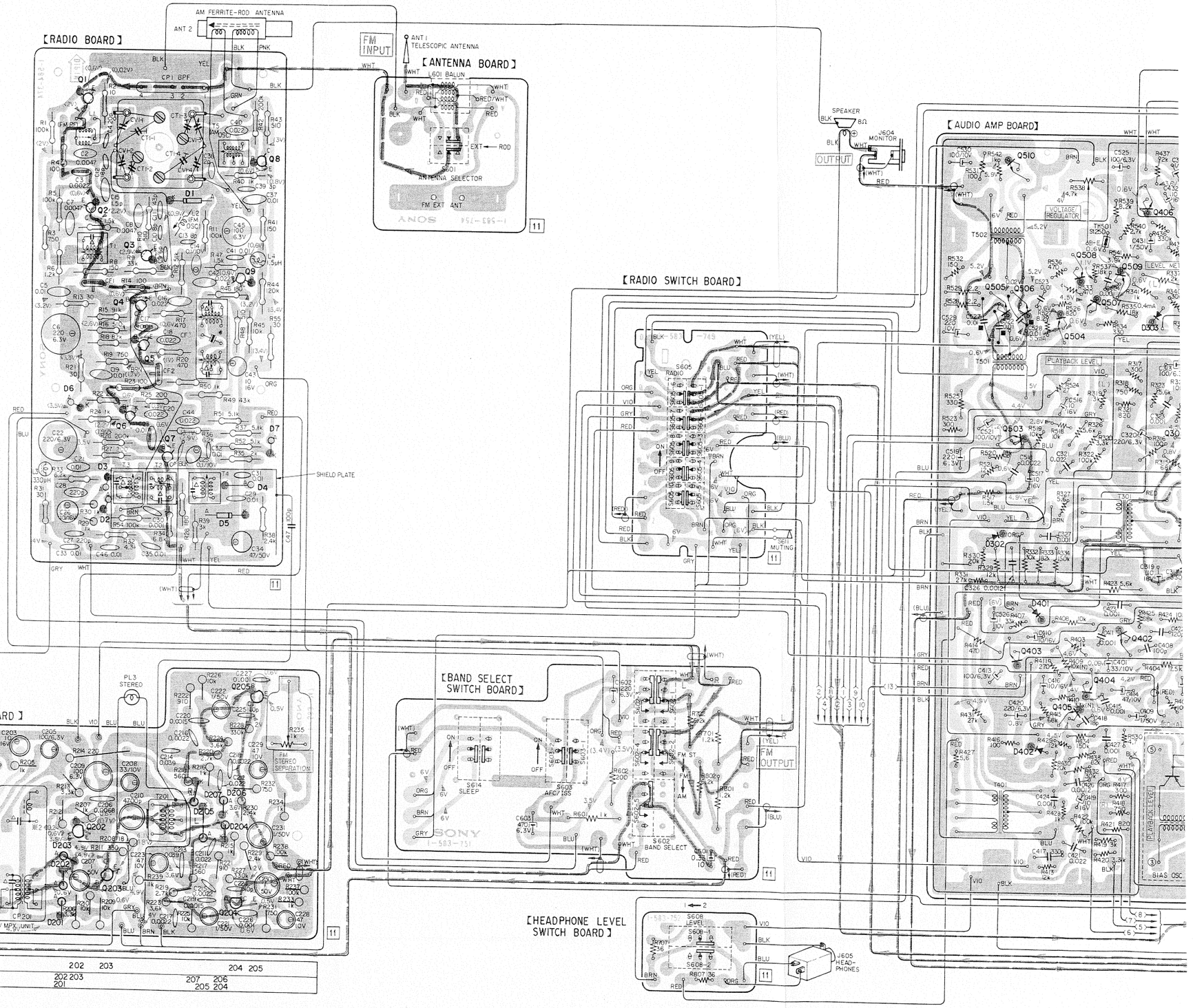
D1: 1S2687S
D2, 3, 5: 1T261
D6, 7: 1S1555
D4, 202, 203
D302, 303
D402, 403, 501 } 1T22
D204~207: 1T22A
D201, 301, 401
D601 } CD860011



D502: S1RB-10



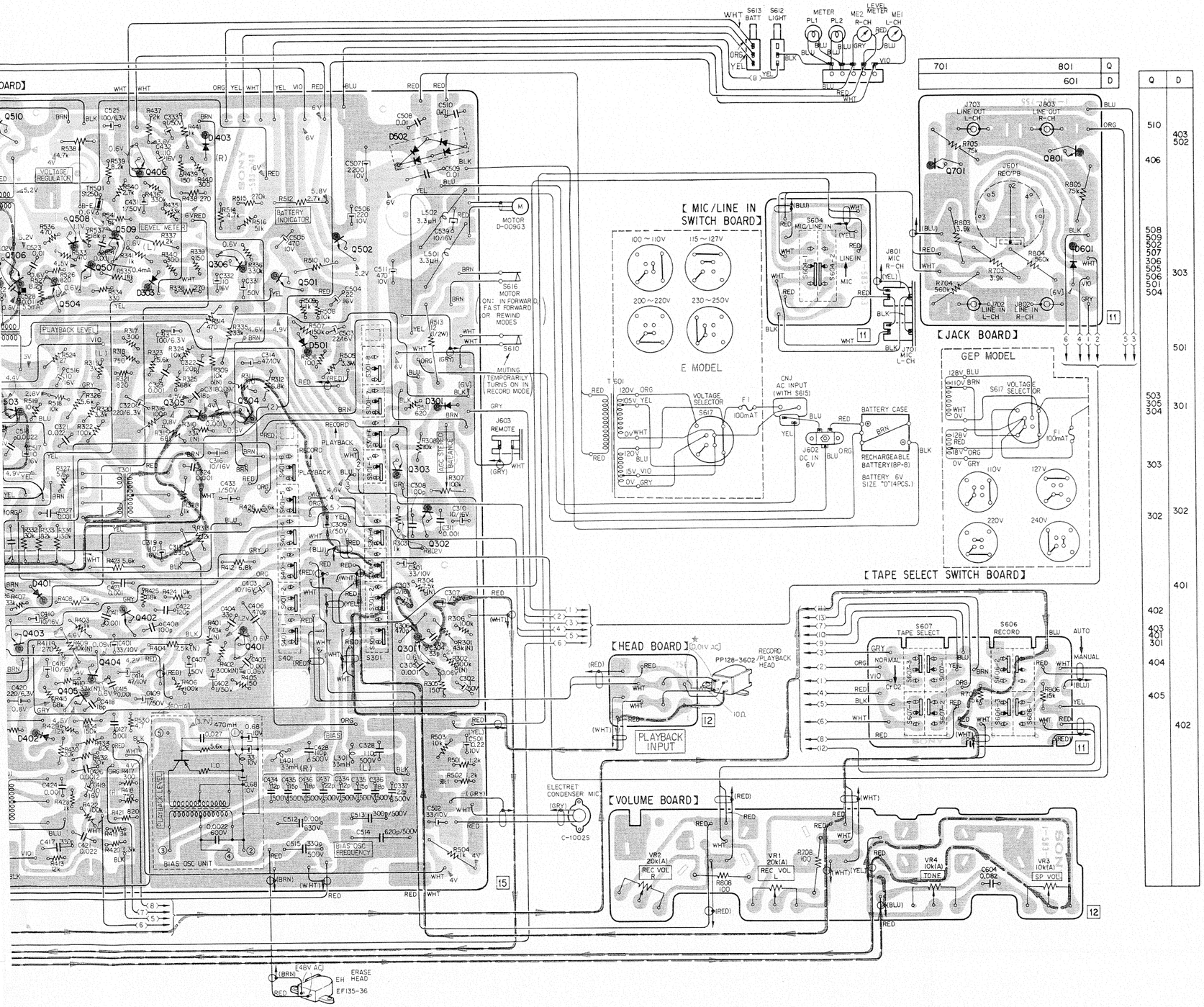
D	Q
	1
	8
1	2
	3
	9
	4
	5
6	6
7	7
3 4	
2 5	



Q	201	202	203	204	205
D		202 203 201		207 206 205 204	

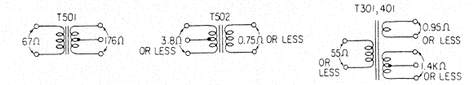
Note:

- ■ indicates parts on the conductor side.
- Color in ( ) indicates color of sleeving over the end portion of shielded wire.
- : signal path
- : B+ pattern



Note:

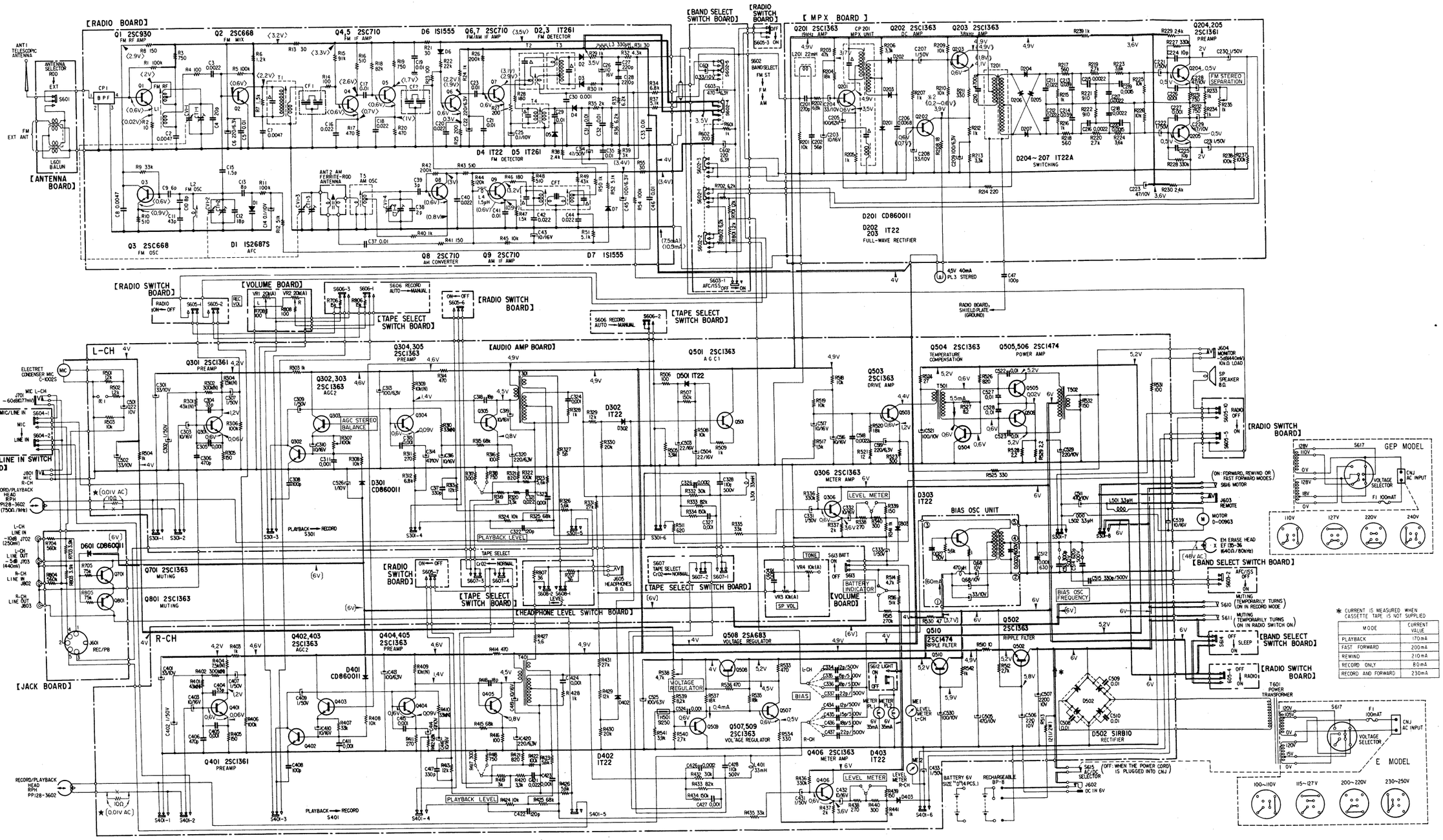
- All capacitors are in μF unless otherwise noted. 50 or less working volts are omitted except for electrolytic type. p = μμF.
- All resistors are in Ω, ¼ W, unless otherwise noted. k = 1,000 M = 1,000 k
- Coil resistances are out-of-circuit values.



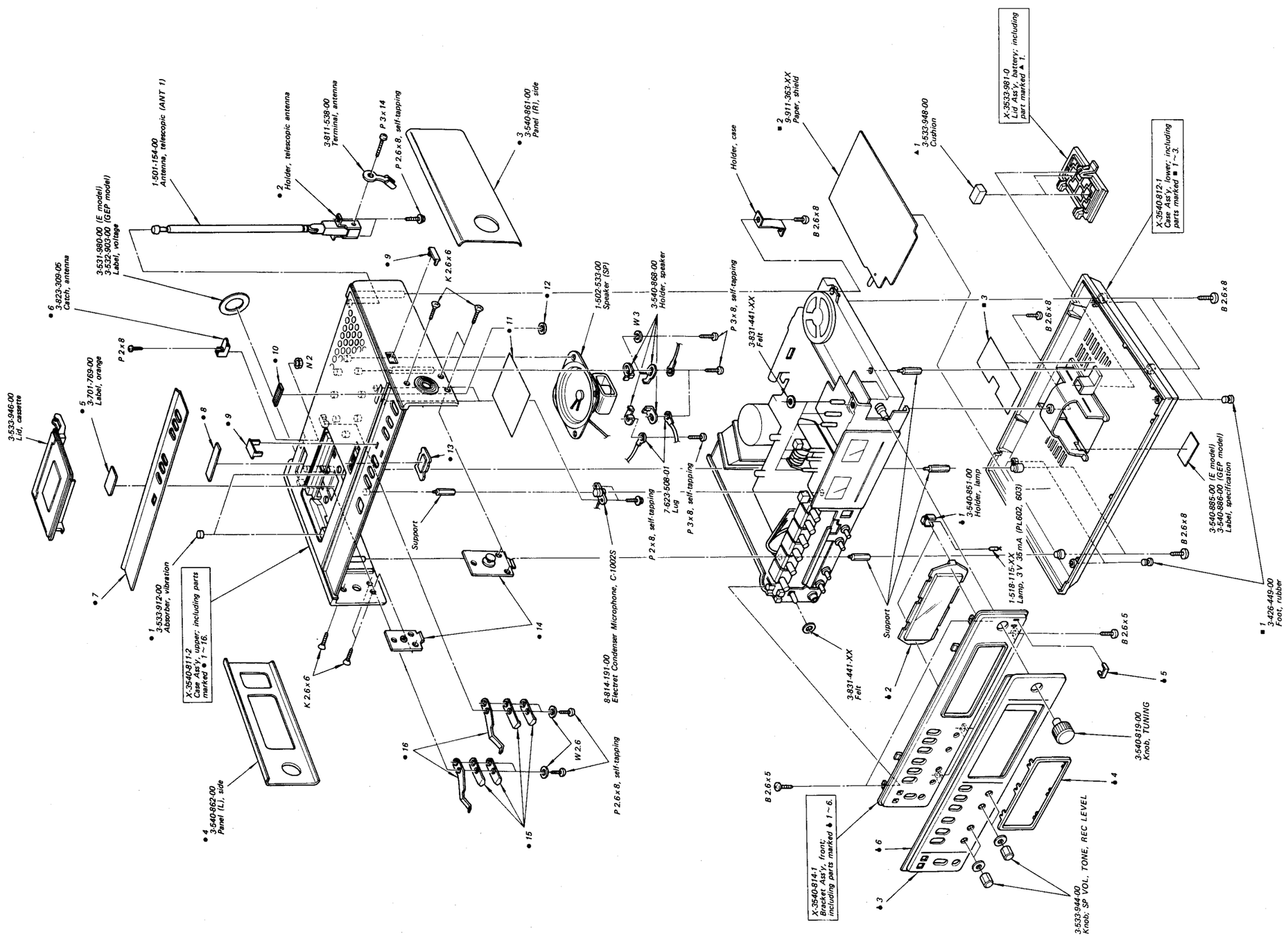
- △ indicates internal components.
- ⏚ indicates chassis ground.
- ※ 1 Connect these points for a red-marked microphone.
- ▬ indicates B+ circuit.
- Voltages are DC with respect to ground unless otherwise noted. Readings are taken under no-signal conditions with a VOM (20 kΩ/V). Readings in [ ] are in record mode. < > : FM ( ) : AM ≪ ≫ : FM STEREO no mark: common
- Voltage variations may be noted due to normal production tolerances.
- ★ Connect this resistor only when measuring the voltage.
- AC voltage readings on bias oscillator circuit are taken with a VTVM.
- Voltage between base and emitter are measured with 2.5 V range.
- ※ 2 Varies according to signal strength.
- Switch Mode:

Ref. No.	Switch	Position
S301-1~301-8		
S401-1~401-6	RECORD/PLAYBACK	PLAYBACK
S601	ANTENNA	ROD
S602-1~602-5	BAND SELECT	FM ST
S603-1, 603-2	AFC/ISS	OFF
S604-1, 604-2	MIC/LINE IN	MIC
S605-1~605-10	RADIO	OFF
S606-1~606-3	RECORD	AUTO
S607-1~607-4	TAPE SELECT	NORMAL
S608-1, 608-2	LEVEL	2
S610	MUTING	OFF
S611	MUTING	OFF
S612	LIGHT	OFF
S613	BATT	OFF
S614	SLEEP	OFF
S615	AC/DC	DC
S616	MOTOR	OFF
S617	VOLTAGE SELECTOR	100~110 V

7. SCHEMATIC DIAGRAM



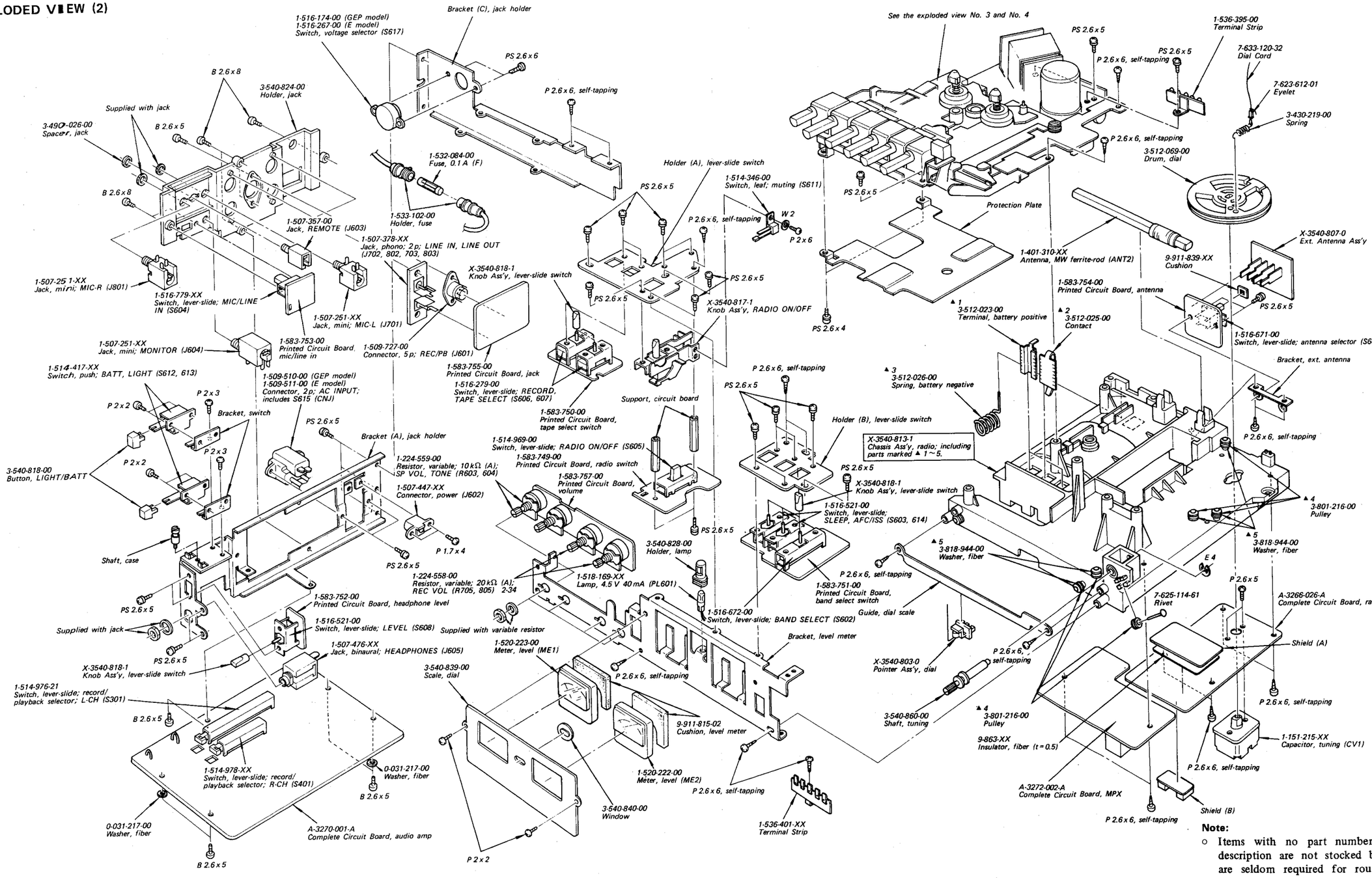
8. EXPLODED VIEW (1)



Note:

- Items with no part number and/or no description are not stocked because they are seldom required for routine service.
- All screws are Phillips (cross recess) type unless otherwise noted.
  (–) = slotted head

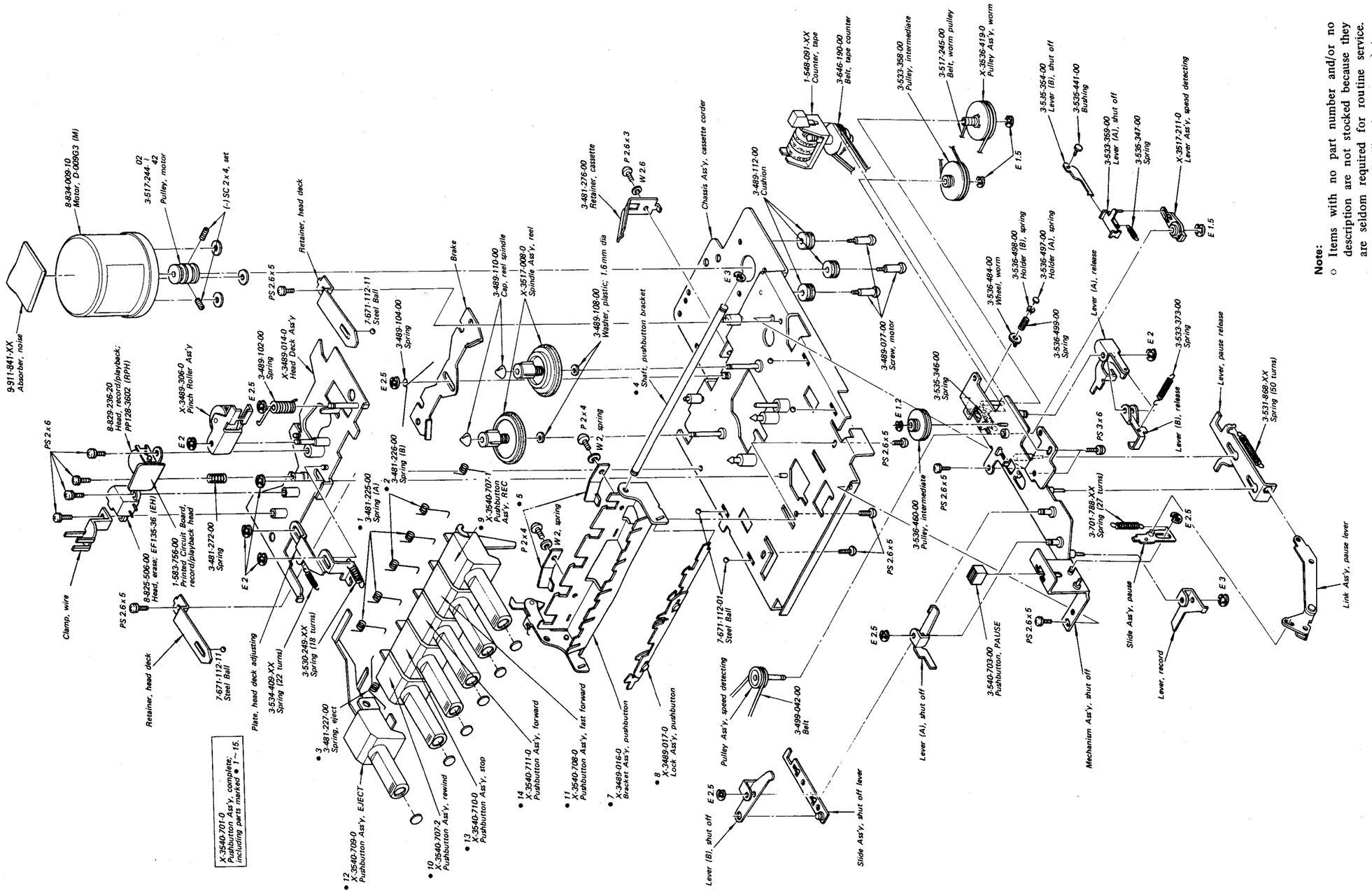
9. EXPLODED VIEW (2)



Note:

- Items with no part number and/or no description are not stocked because they are seldom required for routine service.
- All screws are Phillips (cross recess) type unless otherwise noted.
  (–) = slotted head
- (□□T) shows the number of coils in spring.

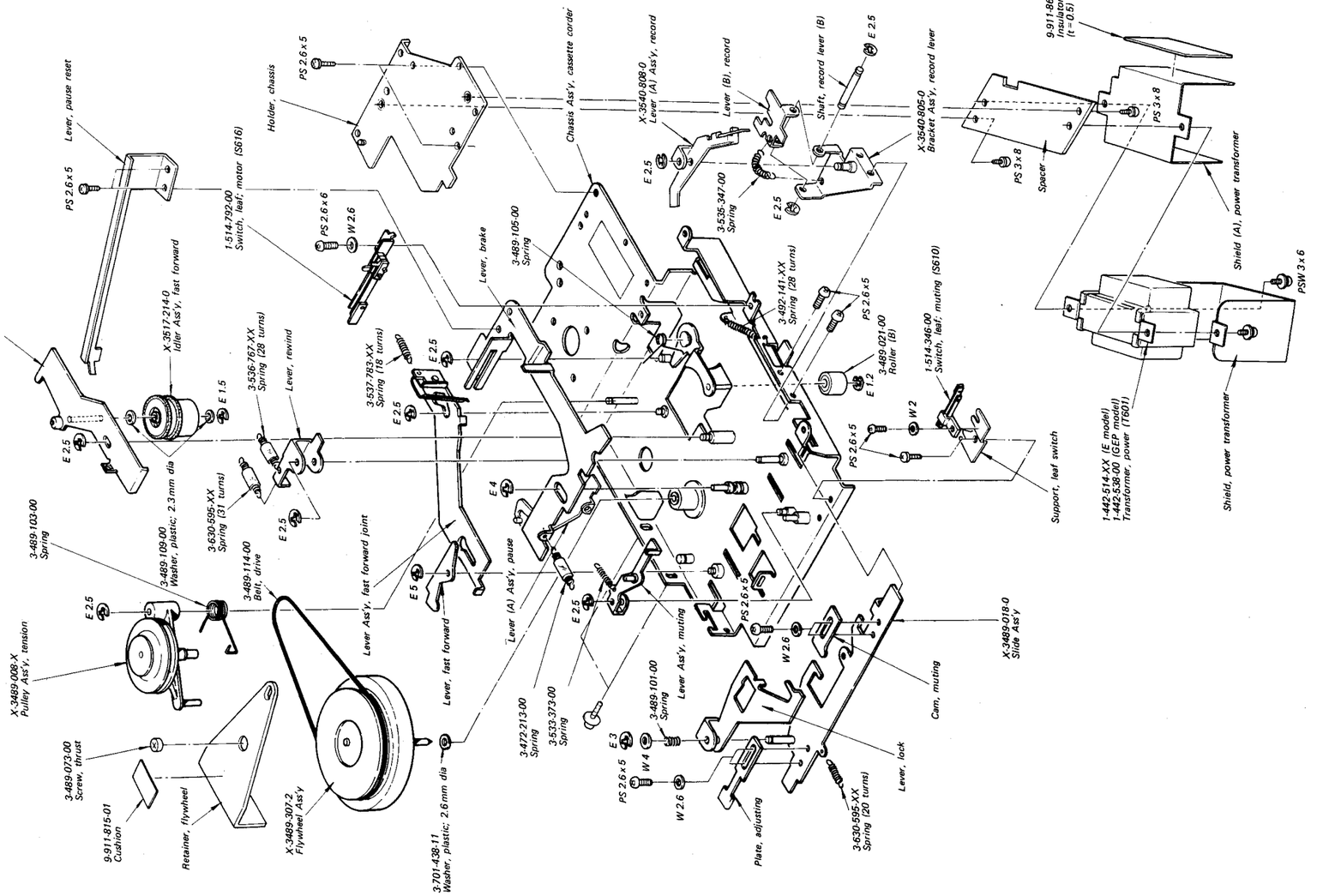
10. EXPLODED VIEW (3)



Note:

- Items with no part number and/or no description are not stocked because they are seldom required for routine service.
- All screws are Phillips (cross recess) type unless otherwise noted.
  (-) = slotted head
- (□□T) shows the number of coils in spring.

11. EXPLODED VIEW (4)



Note:

- Items with no part number and/or no description are not stocked because they are seldom required for routine service.
- All screws are Phillips (cross recess) type unless otherwise noted.
  (-) = slotted head
- (□□T) shows the number of coils in spring.

12. ELECTRICAL PARTS LIST

Ref. No.	Part No.	Description
	COMPLETE CIRCUIT BOARDS	
	A-3266-026-A	Radio
	A-3270-001-A	Audio Amp
	A-3272-002-A	MPX
	PRINTED CIRCUIT BOARDS	
	1-583-749-00	Radio Switch
	1-583-750-00	Tape Select Switch
	1-583-751-00	Band Select Switch
	1-583-752-00	Headphone Level
	1-583-753-00	Mic/Line In
	1-583-754-00	Antenna
	1-583-755-00	Jack
	1-583-756-00	Record/Playback Head
	1-583-757-00	Volume
	SEMICONDUCTORS	
	Transistor	
Q1	2SC930	
Q2,3	2SC668	
Q4~9	2SC710	
Q201~203	2SC1363	
Q204,205	2SC1361	
Q301,401	2SC1361	
Q302,402	2SC1363	
Q303~306, Q403~406	2SC1363	
Q501~504	2SC1363	
Q505,506	2SC1474	
Q507	2SC1363	
Q508	2SA683	
Q509	2SC1363	
Q510	2SC1474	
Q701,801	2SC1363	

Ref. No.	Part No.	Description
	Diode	
D1		1S2687S
D2,3		1T261
D4		1T22
D5		1T261
D6,7		1S1555
D201		CD860011
D202,203		1T22
D204~207		1T22A
D301,401		CD860011
D302,303, D402,403, D501		1T22
D502		S1RB10
D601		CD860011
TH501	1-800-198-XX	Thermistor S-1250
	COILS	
L1	1-425-632-00	FM Rf
L2	1-405-705-00	FM Osc
L3	1-407-175-XX	Microinductor, 330 μH
L4	1-407-180-XX	Microinductor, 1.5 μH
L201	1-407-418-00	Microinductor, 22 mH
L301,401	1-407-836-00	Microinductor, 33 mH
L501,502	1-407-484-00	Microinductor, 3.3 μH
L601	1-417-025-00	FM EXT ANT
	TRANSFORMERS	
T1	1-403-872-00	FM IFT
T2	1-403-952-00	FM Discri
T3	1-403-953-00	FM Discri
T4	1-403-801-00	AM IFT
T5	1-405-655-00	Coil, a-m osc
T201	1-425-260-00	MPX
T301,401	1-427-317-00	Output
T501	1-423-049-XX	Input
T502	1-427-256-00	Output

Ref. No.	Part No.	Description
T601	1-442-514-XX	Power (E model)
	1-442-538-00	Power (GEP model)
CFT	1-403-144-00	CFT

CAPACITORS

All capacitors are in μF unless otherwise indicated.
50 or less working volts are omitted except for electrolytic type (elect = electrolytic, p = μμF)

C2	1-101-922-11	0.0047		ceramic
C3	1-101-919-11	0.0022		ceramic
C4	1-102-958-11	20 p		ceramic
C5	1-101-923-11	0.01		ceramic
C6	1-121-419-11	220	6.3 V	elect
C7,8	1-101-922-11	0.0047		ceramic
C9	1-102-505-11	6 p		ceramic
C10	1-102-865-11	8 p		ceramic
C11	1-102-521-11	43 p		ceramic
C12	1-101-972-11	18 p		ceramic
C13	1-102-865-11	8 p		ceramic
C14	1-127-019-11	0.1	10 V	solid aluminum
C15	1-101-576-11	1.5 p		ceramic
C16	1-101-924-11	0.022		ceramic
C17	1-101-923-11	0.01		ceramic
C18	1-101-924-11	0.022		ceramic
C19	1-101-923-11	0.01		ceramic
C20	1-101-924-11	0.022		ceramic
C21	1-101-923-11	0.01		ceramic
C22	1-121-419-11	220	6.3 V	elect
C23	1-101-923-11	0.01		ceramic
C24	1-102-935-11	2 p		ceramic
C25	1-127-019-11	0.1	10 V	solid aluminum
C26	1-121-651-11	10	16 V	elect
C27,28	1-107-093-11	220 p		silvered mica
C29	1-101-923-11	0.01		ceramic
C30	1-105-661-12	0.001		mylar
C31,32	1-105-673-12	0.01		mylar
C33	1-101-923-11	0.01		ceramic
C34	1-121-391-11	1	50 V	elect
C35	1-101-923-11	0.01		ceramic

Ref. No.	Part No.			Description
C37	1-101-923-11	0.01		ceramic
C38	1-101-742-11	2 p		ceramic
C39	1-101-743-11	3 p		ceramic
C40	1-101-924-11	0.022		ceramic
C41	1-105-673-12	0.01		mylar
C42	1-101-924-11	0.022		ceramic
C43	1-121-651-11	10	16 V	elect
C44	1-101-924-11	0.022		ceramic
C45	1-121-413-11	100	6.3 V	elect
C46	1-101-923-11	0.01		ceramic
C47	1-102-975-11	100 p		ceramic
C201	1-107-141-11	270 p		silvered mica
C202	1-107-125-11	56 p		silvered mica
C203	1-121-651-11	10	16 V	elect
C204	1-121-402-11	33	10 V	elect
C205	1-121-413-11	100	6.3 V	elect
C206	1-105-671-12	0.0068		mylar
C207	1-121-391-11	1	50 V	elect
C208	1-121-402-11	33	10 V	elect
C209	1-121-413-11	100	6.3 V	elect
C210	1-103-575-11	4700 p		polystyrol
C211,212	1-105-677-12	0.022		mylar
C213,214	1-105-680-12	0.039		mylar
C215~218	1-105-665-12	0.0022		mylar
C219,220	1-105-663-12	0.0015		mylar
C221,222	1-121-391-11	1	50 V	elect
C223	1-121-352-11	47	10 V	elect
C224,225	1-107-107-11	10 p		silvered mica
C226,227	1-102-074-11	0.001		ceramic
C228,229	1-121-352-11	47	10 V	elect
C230,231	1-121-391-11	1	50 V	elect
C301,401	1-121-402-11	33	10 V	elect
C302,402	1-121-391-11	1	50 V	elect
C303,403	1-121-651-11	10	16 V	elect
C304,404	1-107-119-11	33 p		silvered mica
C305,405	1-102-074-11	0.001		ceramic
C306,406	1-107-244-11	470 p		silvered mica
C307,407	1-121-391-11	1	50 V	elect
C308,408	1-102-973-11	100 p		ceramic
C309,409	1-121-391-11	1	50 V	elect
C310,410	1-121-651-11	10	16 V	elect
C311,411	1-102-074-11	0.001		ceramic

Ref. No.	Part No.		Description
C313,413	1-102-413-11	100	6.3 V elect
C314,414	1-102-352-11	47	10 V elect
C315,415	1-102-074-11	0.001	ceramic
C316,416	1-121-651-11	10	16 V elect
C317,417	1-107-143-11	330 p	silvered mica
C318,418	1-107-113-11	18 p	silvered mica
C319,419	1-121-651-11	10	16 V elect
C320,420	1-121-419-11	220	6.3 V elect
C321,421	1-105-677-12	0.022	mylar
C322,422	1-107-133-11	120 p	silvered mica
C323,423 C324,424	1-105-661-12	0.001	mylar
C326,426	1-105-662-12	0.0012	mylar
C327,427	1-105-661-12	0.001	mylar
C328,428	1-107-170-11	110 p	500 V silvered mica
C331,431	1-121-391-11	1	50 V elect
C332,432	1-121-651-11	10	16 V elect
C333,433	1-121-391-11	1	50 V elect
C334,434	1-107-050-11	12 p	500 V silvered mica
C335,435	1-107-051-11	15 p	500 V silvered mica
C336,436	1-107-001-11	18 p	500 V silvered mica
C337,437	1-107-052-11	22 p	500 V silvered mica
C501	1-127-020-11	0.22	10 V solid aluminum
C502	1-121-402-11	33	10 V elect
C503,504	1-121-479-11	22	16 V elect
C505	1-121-425-11	470	10 V elect
C506	1-121-420-11	220	10 V elect
C507	1-121-659-11	2200	10 V elect
C508~510	1-102-129-11	0.01	ceramic
C511	1-121-425-11	470	10 V elect
C512	1-129-702-11	0.001	630 V plastic
C513	1-107-180-11	300 p	500 V silvered mica
C514	1-107-188-11	620 p	500 V silvered mica
C515	1-107-181-11	330 p	500 V silvered mica
C516,517	1-121-651-11	10	16 V elect
C518	1-105-665-12	0.0022	mylar
C519	1-121-419-11	220	6.3 V elect
C521	1-121-414-11	100	10 V elect
C522,523	1-105-673-12	0.01	mylar
C524	1-105-661-12	0.001	mylar
C525	1-121-413-11	100	6.3 V elect

Ref. No.	Part NO.		Description
C526	1-127-023-11	1	10 V solid aluminum
C527,528	1-105-673-12	0.01	mylar
C529	1-121-420-11	220	10 V elect
C530	1-121-414-11	100	10 V elect
C601	1-127-021-11	0.33	10 V solid aluminum
C602	1-121-419-11	220	6.3 V elect
C604	1-105-684-12	0.082	mylar
CV1	1-151-215-XX	Tuning	

RESISTORS

All resistors are in ohms. Regular-type 1/4 W carbon, composition resistors and 1/8 W carbon resistors in radio circuit board are omitted. Check the schematic diagram for the resistance values. k = 1,000, M = 1,000 k

R235	1-224-642-XX	1 k, adjustable
R307	1-222-777-11	100 k, adjustable
R538	1-222-773-11	4.7 k, adjustable
R603,604	1-224-559-00	10 k (A), variable; SP VOL, TONE
R705,805	1-224-558-00	20 k (A), variable; REC VOL

SWITCHES

S301	1-514-976-XX	Lever-slide, record/playback selector; L-CH
S401	1-514-978-XX	Lever-slide, record/playback selector; R-CH
S601	1-516-671-00	Lever-slide, antenna selector
S602	1-516-672-00	Lever-slide, BAND SELECT
S603	1-516-521-00	Lever-slide, SLEEP
S604	1-514-779-XX	Lever-slide, MIC/LINE IN
S605	1-514-969-00	Lever-slide, RADIO ON/OFF
S606,607	1-516-279-00	Lever-slide, RECORD, TAPE SELECT
S608	1-516-521-00	Lever-slide, LEVEL
S610,611	1-514-346-00	Leaf, muting
S612,613	1-516-417-XX	Push, BATT, LIGHT
S614	1-516-521-00	Lever-slide, AFC/ISS
S615		Included in connector (CNJ)
S616	1-514-792-00	Leaf, motor

Ref. No.	Part No.	Description
S617	1-516-174-00	Voltage Selector (GEP model)
	1-516-267-00	Voltage Selector (E model)

JACKS

J601	1-509-727-00	Connector, 5 p; REC/PB
J602	1-507-447-XX	Connector, power
J603	1-507-357-00	REMOTE
J604	1-507-251-XX	Mini, MONITOR
J605	1-507-476-XX	Binaural, HEADPHONES
J701,801	1-507-251-XX	Mini, MIC-L, R
J702,802 J703,803	1-507-378-XX	Phono, 2 p; LINE IN, LINE OUT
CNJ	1-509-511-00	Connector 2 p; AC INPUT; includes S615 (E model)
	1-509-510-00	Connector, 2 p; AC INPUT; includes S615 (GEP model)

MISCELLANEOUS

ANT1	1-501-154-00	Antenna, telescopic
ANT2	1-401-310-XX	Antenna, MW ferrite-rod
CF1,2	1-527-184-11	Filter, ceramic; 10.7 MHz
CP1	1-231-286-00	Band Pass Filter
CP201	1-425-548-00	MPX Unit
F	1-532-084-00	Fuse 0.1 A
	8-814-191-10	Electret Condenser Microphone, C-1002S
M	8-834-009-10	Motor, D-009G
ME1	1-520-223-00	Meter, level
ME2	1-520-222-00	Meter, level
PL601	1-518-169-XX	Lamp 4.5 V 40 mA
PL602,603	1-518-115-XX	Lamp 3 V 35 mA
EH	8-825-506-00	Head, erase; EF135-36
RPH	8-829-236-20	Head, record/playback; PP128-3602
SP	1-502-533-00	Speaker
	1-464-025-00	Bias Osc Unit
	1-533-102-00	Holder, fuse
	1-536-395-00	Terminal Strip
	1-536-401-XX	Terminal Strip, 2L2

ACCESSORIES

X-3701-018-2	Tips Ass'y, head cleaning
1-501-083-21	Antenna, feeder
1-504-034-12	Earphone, ME-20
1-528-022-00	Battery, size "D" (E model)
1-534-830-00	Cord, power; DK-33 (E model)
1-534-840-XX	Cord, power; DK-38 (GEP model)
3-780-834-11	Manual, instruction

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